

REMARKS/ARGUMENTS

The present invention teaches a way to form a magnetically pinned layer by allowing it to overlap an antiferromagnetic layer only at its edges, leaving most of the pinned layer with no contact to an antiferromagnetic layer, thereby removing the possibility of any shunting effects by the latter.

Reconsideration is requested of the rejection of claims 1 through 3 under 35 U.S.C. 102(b) as being anticipated by Saito et al. 6,112,402 and Sato 2002/0191353:

Regarding our claim 1; as currently amended, it reads as follows:

1. A method to form a magnetically pinned layer, comprising:

providing a layer of antiferromagnetic material having a top surface and an edge that is different from said top surface; and

depositing a layer of magnetic material, only a part of which contacts both said top surface and said edge, thereby forming said magnetically pinned layer, only a part of which overlies said layer of antiferromagnetic material.

As previously noted, Saito et al. teaches away from the present invention because Saito describes a method for stabilizing the edges of a magnetically FREE layer. Both examiner and Saito note that layer 3, which is between the two inside edges of antiferromagnetic layer 10, is a free layer. Neither the present invention nor Saito's would work if their free and pinned layers were interchanged.

For the current rejection examiner now further relies on Sato, arguing that Sato specifically states that a pinned layer can be formed from a trilayer (ferromag-AFM coupling-ferromag). This is certainly true but has no relevance to the present invention since Sato teaches away from the present invention. Specifically, in Sato's FIG. 10 pinned layer 34 is in contact with antiferromagnetic layer 33 over its entire length whereas the present invention teaches that only a part of the pinned layer is in contact with the antiferromagnetic layer.

Reconsideration is requested of the rejection of claim 4 under 35 U.S.C. 103(a) as being unpatentable over the combination of Saito et al., Tobise et al. (5,748,416) and Gill (6,097,579):

As already noted in our discussion of amended claim 1, Saito teaches a method for connecting an antiferromagnetic layer to a free layer not to a pinned layer. This is for the purpose of suppressing Barkhausen noise. If this caused Saito's free layer to become a pinned layer the device would no longer function. Thus, no combination of Saito with any other reference, including Tobise et al. and Gill, can render the present invention unpatentable.

Reconsideration is requested of the rejection of claim 6 under 35 U.S.C. 103(a) as being unpatentable over the combination of Saito et al., Tobise et al. and Gill and further in view of Hasegawa (5,910,344):

Examiner states that "ferromagnetic layers (e.g. 42, 44) can be 'antiparallel' in magnetizations (see a and b directions in Fig. 3).....". This is incorrect. It is clear from the symbols used to denote the directions ( $\rightarrow$  for a and  $\otimes$  for b) that they are not antiparallel, but orthogonal. Furthermore in col. 6 lines 12 to 18 (cited by examiner) Hasegawa states "In the present invention, the magnetization of the ferromagnetic layer having **pinned** magnetization reversal is

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preferably substantially **perpendicular** to the magnetization of the ferromagnetic layer having **free** magnetization without an external magnetic field...." (emphasis added).

Examiner has rebutted this argument by stating that "orthogonal" is an example of "antiparallel"). We respectfully point out that examiner is mistaken. "Antiparallel" is a term of art used to describe two lines that point in directions that differ one from another by 180 degrees. The term "antiparallel" does not mean "against being parallel" as examiner asserts. Lines that are not parallel are referred to as non-parallel lines. It is conceivable that "anti-parallel" or "anti parallel" might have the meaning that examiner claims but "antiparallel" is a single word whose meaning is as we have stated above.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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